

3/9/98

SUBJ: Flight Inspection/Air Traffic On-Site Coordination Requirements

1. PURPOSE. This order outlines flight inspection procedural and communication requirements and depicts flight maneuvers for flight inspection of Terminal Navigational Aids. Flight Maneuvers are outlined and categorized by reference terms to provide for standardized communications between Flight Inspection and Air Traffic personnel.

2. DISTRIBUTION. This order is distributed to Division level in Aviation System Standards, Air Traffic Operations Program, and Air Traffic Airspace Management Program; Regional Air Traffic/Airway Facilities Divisions, Air Traffic Facilities, and Flight Inspection Offices.

3. CANCELLATION. Order 8240.41A, Flight Inspection/Air Traffic Coordination, dated April 26, 1993, is canceled.

4. BACKGROUND. Coordination/approval of flight inspection operations rely upon air traffic control preplanning and expertise. The safe, orderly, expeditious handling of air traffic can be severely impacted by certain flight inspection requirements (i.e., transitioning through facility sectors/airspace boundaries, opposite direction approaches, etc.)

a. Existing AT Directives. Order 7110.65, Air Traffic Control Handbook, Chapters 2 and 9, and Order 7210.3, Facility Operation and Administration, Chapter 6, Section 2, specify the priority and special handling to be afforded flight inspection aircraft.

b. To effectively and expeditiously accomplish flight inspection requirements, controllers are relied upon to accomplish inter and intra facility coordination and adjust the flow of traffic. To minimize the impact of a flight inspection upon the system and the air traffic controllers, inspectors must communicate their plans, priorities, and options to the controllers. Air Traffic will always attempt to provide special handling, but it must be recognized that unforeseen wind conditions, weather, and/or heavy traffic flows may affect the controller's ability to provide priority or special handling at the specific time requested. Preplanning, coordination, and understanding of respective capabilities, responsibilities, and terminology are the bases for the effective accomplishment of both Air Traffic and Flight Inspection missions. Standardization of flight inspection maneuvers and terminology will reduce operational impacts. To preclude confusion, the standard terminology found in this order should be used.

c. The alternatives to discontinued recorded runs and/or denial of flight inspection requests include increased costs to the agency, prolonged equipment outages, and possible extended delays to the users. Program requirements can best be met by the interaction and cooperation of both AT and AVN personnel. The provisions of this Order have been coordinated with the Air Traffic Service.

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Program Director of Aviation
System Standards

APPENDIX 1. ON-SITE COORDINATION STANDARD OPERATING PROCEDURES

Flight inspection of navigational aids requires in-flight evaluation of signals-in-space and the associated airspace. Flight inspection procedural requirements of specific interest to Air Traffic are:

a. ILS/MLS.

(1) For the purpose of Air Traffic Control/Flight Inspection Coordination, ILS/MLS flight inspections are of five basic types; commissioning, special flight inspections, periodic, periodic with monitors, and surveillance. To preclude confusion, the standard terminology should be used.

(2) Commissioning. Comprehensive evaluations of ILS/MLS service/performance requiring lengthy (8 hours+) of flight evaluation will not be covered in this Order. These flight inspections will be coordinated by the pilot-in-command (PIC) with Air Traffic, on-site, prior to the actual inspection.

(3) Special Flight Inspections. Handled on an individual basis and may require from one recorded run to a commissioning type flight inspection (reference United States Standard Flight Inspection Manual, Order 8200.1A, Section 104).

(4) Routine ILS/MLS flight inspection maneuvers are depicted in Appendix 3 which contains supplemental information of mutual concern to Flight Inspection/Air Traffic and specific phraseology to be utilized by both controllers and flight inspection crews. The actual number of recorded "runs" can be estimated by the PIC and furnished to Air Traffic prior to the actual flight inspection. Flight inspection planning is predicated upon ground equipment configuration, number of transmitters, etc. Air Traffic must be aware that ground and/or airborne problems can require modification of initial plans. Changes shall be relayed to Air Traffic as soon as feasible. ILS/MLS flight inspection requirements for regularly scheduled evaluations are:

(a) Periodic (P). A regular scheduled flight inspection to determine facility performance and compliance with established tolerances.

1 Unless required by out-of-tolerance conditions, the flight inspection will require the following:

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|-------------------------------------|------------------|
| (aa) Front Course. | |
| "FLIGHT INSPECTION ARC" | = 1 recorded run |
| "FLIGHT INSPECTION HOLDING PATTERN" | = 1 recorded run |
| "FLIGHT INSPECTION LOW APPROACH" | = 1 recorded run |
| (bb) Back Course (if authorized). | |
| "FLIGHT INSPECTION ARC" | = 1 recorded run |
| "FLIGHT INSPECTION LOW APPROACH" | = 1 recorded run |

(b) Periodic with Monitors (PM). A scheduled flight inspection to ascertain that both facility and electronic monitor performance are within established limits.

1 Depending on both ground equipment configuration and number of transmitters, and unless otherwise required by out-of-tolerance equipment, the flight inspection for each transmitter will consist of:

- (aa) Front Course.
 - "FLIGHT INSPECTION ARC"
or multiple racetrack patterns = 4 recorded runs
 - "FLIGHT INSPECTION HOLDING PATTERN" = 4 - 10 recorded runs
 - "FLIGHT INSPECTION LOW APPROACH" = 1 - 2 recorded runs
- (bb) Back Course.
 - "FLIGHT INSPECTION ARC"
or multiple racetrack patterns = 2 - 4 recorded runs
 - "FLIGHT INSPECTION LOW APPROACH" = 1 recorded run

2 Alignment monitors may be inspected on the ground, which will require the **flight inspection aircraft to be positioned on the approach end of the runway without interruption for 3 - 7 minutes.**

b. VOR/VORTAC/TACAN/RNAV.

(1) Commissioning. Due to a lengthy (10 hours+) flight evaluation, it will not be covered in this Order (reference United States Standard Flight Inspection Manual, Order 8200.1A, Section 201). These inspections will be thoroughly coordinated with appropriate Air Traffic personnel prior to the evaluation.

(2) Special Flight Inspections. Handled on an individual basis and will be coordinated with Air Traffic Control. Special inspections result from user complaints, Air Traffic and Airway Facilities requests, and could be single radial evaluations for after accident inspection, multiple radial inspections on a user complaint, or commissioning type inspection on an equipment changeout or frequency change.

(3) Periodic. Scheduled flight inspection flown to determine facility performance and compliance with established tolerances. Unless required by out-of-tolerance conditions, the flight will require evaluation of the following:

(a) Terminal Approach Radials. Flown at an altitude 100' below procedural altitudes, and includes the approach and missed approach. One recorded run is required on each transmitter.

(b) Airborne Receiver Checkpoints. Flight over a specific geographical point normally at an altitude of 1500' - 4500' AGL. One recorded run is required for each transmitter.

(c) Ground Receiver Checkpoints. Inspected by positioning the flight inspection aircraft over the properly marked checkpoint located on airport ramp or taxiways. Time in position is 3 - 5 minutes to complete the inspection on both transmitters.

(d) Alignment Orbits. Some periodic inspections will require the aircraft to fly a full orbit, usually at a distance of 5 NM at approximately 2,100 to 3,200 feet above site elevation or 10 NM at approximately 4,300 to 6,400 feet above site elevation.

NOTE: Local Airway Facilities personnel can furnish Air Traffic the airborne receiver checkpoints.

c. NDB.

(1) Commissioning. Flight inspection is normally 2 hours in duration. Flown to determine the coverage and quality of the transmitter and to inspect for interference from other stations (reference United States Standard Flight Inspection Manual, Order 8200.1A, Section 207). Commissioning flight inspections will be coordinated with Air Traffic prior to the actual evaluation.

(a) Coverage Orbit. Flown at 1500' above site elevation except where terrain interferes, then the altitude selected will be 1000' AGL. An orbit of the facility will be flown from 15 - 75 miles from the station commensurate with power output of the facility.

(b) Standard Instrument Approach Procedures (SIAP). Flight inspected using published procedural altitudes and will include inspection of the Missed Approach Procedure.

(2) Special Flight Inspections. Handled on an individual basis, and can vary from a commissioning to a procedural type inspection.

(3) Periodic. A regularly scheduled flight inspection of the Standard Instrument Approach Procedure and the facility performance supporting the SIAP. SIAP's will be flown as published using procedural altitudes and will include the Missed Approach Procedure.

d. ASR.

(1) Commissioning. Comprehensive evaluations requiring lengthy (10 hours) flight evaluation to provide engineering, maintenance, and operational personnel with sufficient data to enable them to determine system performance and to provide a basis for the detection of any appreciable amount of future deterioration in the operation of the equipment (reference United States Standard Flight Inspection Manual, Order 8200.1A, Section 215).

(2) Special Flight Inspections. May require anything from a commissioning type inspection to investigating an area for radar coverage where a near midair collision incident occurred. Air Traffic coordination with the flight inspector prior to any flight evaluation is required.

(3) Periodic. A regularly scheduled flight inspection conducted to determine facility performance and compliance with established tolerances. Periodic flight inspections will require:

(a) Two airways or routes flown at MEA.

(b) Fix/map accuracy to be conducted simultaneously with airway and route coverage.

(c) Surveillance approaches and approach procedures using published procedural altitudes.

e. Procedures.

(1) In addition to evaluation of navigational equipment, Flight Inspection personnel must verify controlling obstacles on all segments (final approach, missed approach, circling areas, and departures) of published IFR flight procedures (reference United States Standard Flight Inspection Manual, Order 8200.1A, Section 214).

(2) All terminal flight obstructions must be confirmed prior to procedure publication and periodically thereafter. Obstacle verification may be accomplished by flight inspection aircraft when visual flight rules (VFR) exist for the visual observation of the segment to be evaluated. Controlling obstacles within each segment of a procedure are visually confirmed with special emphasis on obstructions close to the airport.

(3) Flight inspection aircraft accomplishing procedural evaluation missions can be expected by Terminal Air Traffic personnel to follow a procedural track (ILS, NDB, VOR, etc.) at or below published minimum altitudes at reduced airspeeds.

(4) Situations will exist when other than normal flight patterns and low altitude flight for obstacle height determination are required. In all instances, the flight inspection pilot shall coordinate with Air Traffic prior to the actual evaluation and obtain ATC clearance for VFR operation within the segment being flown.

APPENDIX 2. ON-SITE COORDINATION/COMMUNICATION REQUIREMENTS

To ensure Air Traffic awareness of the operational mode of flight inspection aircraft, the following procedures shall be utilized:

a. Flight Inspection.

(1) When filing flight plans, enter in remarks "FC," followed by facility identifiers for ILS scheduled to be flight inspected, followed by the type of inspection to be conducted.
Example: "FC FNT PM" or "FC OKC P."

(2) Utilize call sign "Flight Check (Aircraft #)" ONLY when conducting flight inspection or when en route to a facility where a flight inspection will be conducted. To ensure controller/user awareness of the special handling required during automated terminal operation, add the term "Recorded" to the aircraft call sign.
Example: Recorded flight inspection (special handling required)-"Flight Inspection 52 Recorded."

b. Air Traffic.

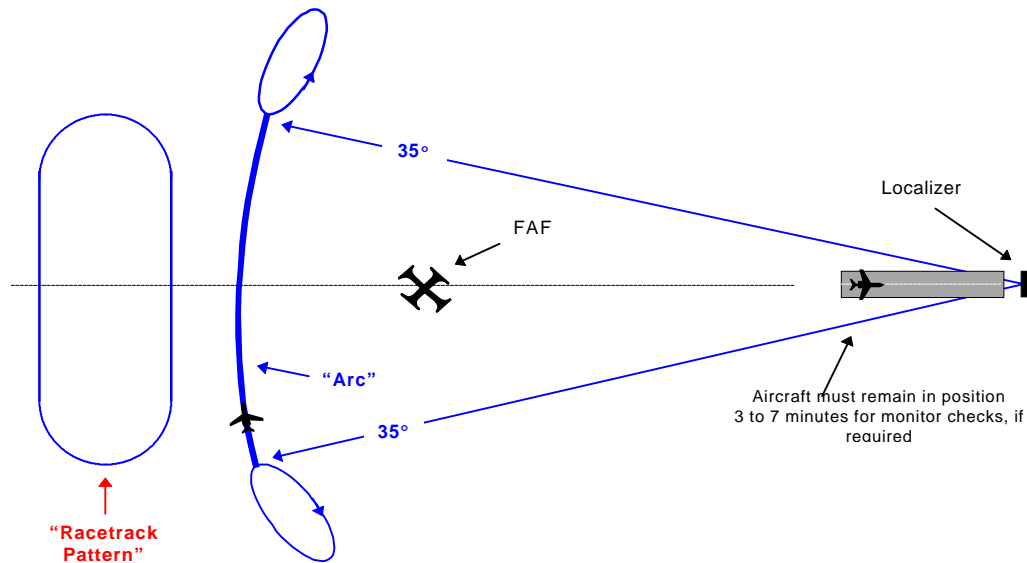
(1) Provide special handling to flight inspection aircraft as provided in Order 7110.65, Chapters 2 and 9.

(2) Ensure pilot awareness of anticipated delays, and, to the maximum extent possible, offer alternative courses of action to expedite completion of inspection programs.

(3) Adhere to the provisions of paragraph 6 - 21, Order 7210.3, with respect to passing impending flight inspection information on to subsequent shifts and/or immediately notifying Flight Inspection Central Operations (FICO)/PIC's when facility Air Traffic activities make it impossible to handle flight inspections expeditiously.

(4) Personnel with knowledge of the MSAW program operation and characteristics shall be available - either AT Support Specialist and/or Operational Support Service (AOS).

“FLIGHT INSPECTION ARC” ILS/MLS Front or Back Course



The racetrack pattern is used only during localizer width monitor checks. The racetrack pattern is flown 90° to the localizer centerline with 5 mile legs. Distance from the Localizer antenna is between 4 and 18 miles or extended service volume (ESV) as required. Arc is flown 4 to 18 miles or ESV from the Localizer antenna.

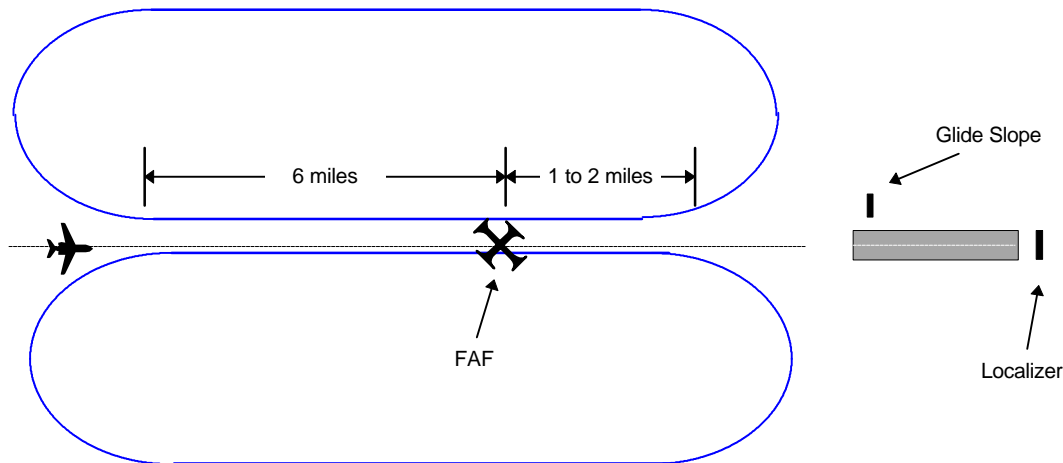
Flight Inspection

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| 1. Altitude: | Glide slope intercept (GSI) altitude to 4500' or ESV altitude above field elevation. |
| 2. Indicated air speed: | Approximately 170 - 250 knots |
| 3. Number of runs | |
| Periodic: | 1 run |
| Periodic with monitors: | 4 - 10 runs |
| 4. Average time to complete inspection | |
| Periodic: | 10 minutes |
| Periodic with monitors: | 45 minutes to 1.5 hours |

Air Traffic

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| 1. Altitude: | Altitude assignments above the glide path intercept altitude may be made by air traffic or requested by flight inspection. |
| 2. IAS: | 170 - 250 knots as requested. |
| 3. Considerations: | Altitude assignments can provide for arrival/departure tunneling. Flight Inspection aircraft may be vectored or delayed outside of the 35° recording area. Direction of turns outside of the recording area are at the discretion of air traffic. |

“FLIGHT INSPECTION HOLDING PATTERN” ILS/MLS Front course only



The flight inspection holding pattern is flown on centerline from 6 miles outside the Final Approach Fix (FAF) (approximately 10 miles from the runway) to approximately 2 miles inside the FAF. The altitude will normally be at GSI. Left or right turns are at the discretion of Air Traffic.

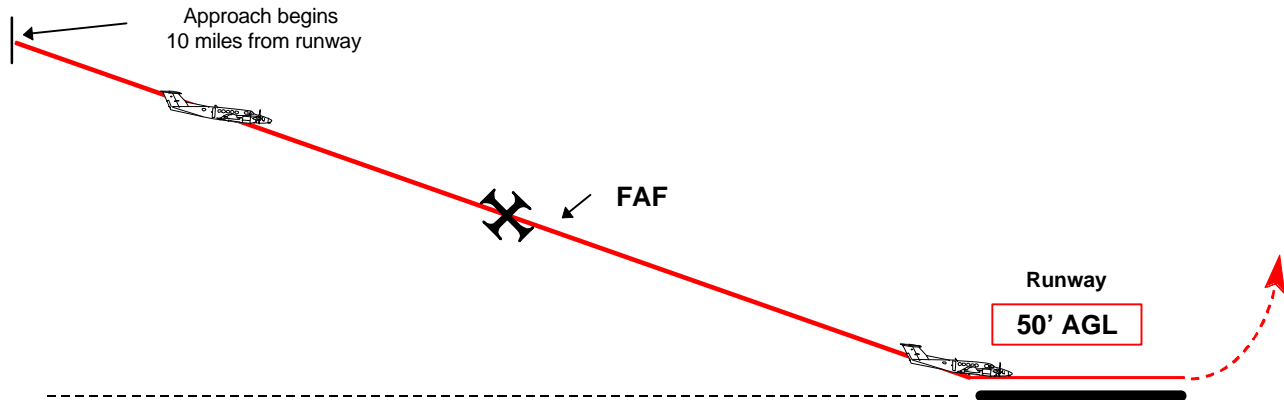
Flight Inspection

- | | |
|--|-------------------------------|
| 1. Altitude: | GSI |
| 2. Indicated air speed: | Approximately 170 - 200 knots |
| 3. Number of runs | |
| Periodic: | 1 run |
| Periodic with monitors: | 4 - 10 runs |
| 4. Average time to complete inspection | |
| Periodic: | 8 minutes |
| Periodic with monitors: | 32 minutes to 1.5 hours |

Air Traffic

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| 1. Altitude: | Air traffic may request higher altitude up to 2000' AGL for the inspection, however, pilot concurrence cannot be assured due to program limitations. |
| 2. IAS: | 170 - 200 knots as requested. |
| 3. Considerations: | Direction of turns as assigned by the controller. Altitude assignments can provide for departure/arrival tunneling. Aircraft may be vectored on outbound legs. |

“FLIGHT INSPECTION LOW APPROACH” ILS/MLS Front or Back Course



Flight Inspection

1. Altitude: Start approximately 500' above the glide slope intercept altitude on the front course and at the initial approach altitude on the back course. The approach begins 10 miles from the runway and terminates at the departure end of the runway. Flight down the runway will be at approximately 50' AGL, from the threshold to the departure end.
2. Indicated air speed: Approximately 140 - 160 knots. (Airspeeds may vary with aircraft type)
3. Number of runs

Periodic:	1 run
Periodic with monitors:	4 - 6 runs
4. Average time to complete inspection

Periodic:	5 minutes
Periodic with monitors:	20 - 30 minutes

Air Traffic

1. IAS: 140 - 160 knots as requested.
2. Turnout: As directed by air traffic. Normally completed within 3 miles of the departure end of the runway. Controller preplanning for avoidance of wake turbulence over the runway is mandatory.
3. Considerations: Air Traffic must ensure no departures or arrivals overfly the localizer transmitter antenna and that the **CRITICAL AREA** remains clear until the flight inspection completes the recorded approach.

